MCj03252700000[1]MCj03519710000[1]

How to Prepare a

MCj03519700000[1]MCj03199360000[1]Science Fair Project

This booklet belongs to: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

MCj03972420000[1]

SCIENCE FAIR PROJECT

COMPLETION SCHEDULE

ASSIGNMENT DUE DATE

TOPIC October 18th (A Day) and October 19th (B Day)

PROJECT PROPOSAL SHEET November 1 (Aday) and November 2(Bday).

QUESTION

HYPOTHESIS

MATERIALS

PROCEDURES

(NO RESULTS/CONCLUSION)

REPORT and Display Board December 7th (A-day) & December 8th (B-DAY)

**November 29 (Aday)and November 30(Bday). For 5 Bonus points**

ORAL PRESENTATION Tentatively: December 21 (Aday) and December 22(Bday).

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HOW TO PREPARE FOR A SCIENCE FAIR PROJECT

SELECT A TOPIC: Choose something that you are interested in and something you want to learn more about.

PURPOSE AND HYPOTHESIS: The purpose is a description of what you will do. The hypothesis is an educated explanation as to what you think will happen.

DESIGNING THE EXPERIMENT: After you have written your hypothesis, you will need to plan an experiment to test. It is important that your experiment do just that, test the hypothesis. Perform the experiment under controlled conditions. Keep careful records in a special notebook that is used only for this paper.

Identify the CONSTANTS and the VARIABLES for your experiment. Remember that constants are the situations that are identical. A variable is something different in the procedure.

RESULTS AND CONCLUSIONS: As you conduct your tests (experiments), you will want to carefully record your observations and measurements in your journal. When your experiment is complete, you will want to show your results in a graph. A line graph or bar graph may be used. Be sure to five your graph a title and label what the graph is showing.

MCj04241780000[1]Once you have graphed your results, you can draw conclusions from the facts. If you hypothesis doesn’t match your results, that is ok. Remember that your hypothesis was a guess about something that you didn’t know about.

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Project Ideas

1. Which soil grows plants the best?
2. Which liquid makes a plant grow best?
3. What food molds the fastest?
4. Will food mold faster in different temperatures?
5. What brand of corn flakes stays the crunchiest in milk the longest?
6. Will an orange mold more quickly with or without a peel?
7. Which brand of milk will spoil fastest?
8. Which fish tank will get dirtier, one with flake food or pellets?
9. Which detergent cleans the best?
10. How does acid affect different kinds of materials?
11. Which brand of ice cream melts the quickest?
12. Which dish soap makes the most bubbles?
13. Which bubble bath soap lasts the longest?
14. Do ants like sweet, sour, or salty best?
15. Does a bath take less water than a shower?
16. Does warm water freeze faster than cool water?
17. Do different types of apples have the same number of seeds?
18. Which materials absorb the most water?
19. Does a ball roll farther on grass or dirt?
20. Which paper towel is the strongest?
21. Which type of batter runs longest?
22. What factors increase the rate at which milk sours?
23. Does the color of water affect its rate of evaporation?
24. Does salt content have any effect on the freezing of water?
25. Do different soils hold different amounts of water?
26. Which factor most affects the rate of evaporations: temperature, humidity or wind speed?
27. Which metal conducts heat the fastest: copper, steel or iron?
28. How do detergents affect the surface tension of water?
29. Does the amount of air inside a ball effect the height of its bounce?
30. Which brand of popcorn pops the most kernels?
31. How does omitting an ingredient affect a cookie?
32. Which brand of glue works best?
33. Do all colors fade at the same rate?
34. Does a baseball go father when hit by a wood bat or a metal bat?
35. Which water proofing agent is best?
36. Which shampoo removes oil best?
37. Which diaper is most absorbent?
38. Which paper airplane design flies the longest?
39. Does sound affect plant growth?
40. Which bridge design is the strongest?
41. Which color do gerbils prefer?
42. Does temperature affect crystal growth?
43. What is the effect of deodorants on clothes?
44. What are the different strengths of wood?
45. How fire affects roofing materials?
46. What holds two boards together better-nail, screw, or glue?

HOW TO PREPARE A SCIENCE FAIR PROJECT

A CONTROLLED EXPERIMENT

To conduct a scientific investigation, care must be taken to follow experimental procedures. You must design an experiment to test your hypothesis. When planning your experiment, remember to keep everything the same except fro the single variable being tested. A variable is something that can be changed in the experiment. It is what you are testing. Everything else must be the same and only one variable or condition is altered or changes. A control group should be used when conducting an experiment. This group receives the same attention as the test groups; however, it will not be influenced by the variable the other groups are testing.

Here is an example:

PURPOSE: How the amount of fertilizer used will affect plant growth.

HYPOTHESIS: If fertilizer is increased in dosage then this will cause greater growth in tomato plants.

The test variable will be the amount of fertilizer used. So all the other variables and conditions must stay the same. That means the following:

1. The seeds must all come from the same package and should be randomly selected.
2. All seeds must be planted in the same sized pots with similar soil.
3. All plants must receive exactly the same amount of water and light.
4. The temperature should be the same for all test plants.
5. More than one plant should be sue din each test group.
6. Set on group as the Control GROUP. This group is not given any fertilizer.
7. Set up two other test groups. One receives a certain amount of fertilizer each week. The other group receives twice as much.

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PROCEDURE CHECK LIST

1. What is the independent variable (IV)?

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1. What is the dependent variable (DV)?

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1. What are the constants?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the Control?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

HOW TO PREPARE A SCIENTIFIC FAIR PROJECT

RECORDING OBSERVATIONS AND DATA

Use a separate notebook for recording all measurements and observations. Record information on a daily basis and consider the following things:

* Make sure that accurate metric measurements are given in your data. Give masses in grams, volumes in milliters, and linear measurements in centimeters.
* It is better to have too much data than not enough so keep a lot of notes.

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* When making an observation, write down the date and time.
* Keep track of the materials used, their quantities and cost.
* Consider taking photographs to be used in your research paper or as part of your display.

HOW TO PREPARE A SCIENCE FAIR PROJECT

CHARTS AND GRAPHS

Your daily long of observations will be the best means for sharing the date and information collected during the experiment. Chants and graphs will provide a fine way to share date in an easy to ready and understand fashion. There are different kinds of charts and graphs. Here are some examples.

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BAR GRAPH

MCj02808160000[1]

CIRCLE GRAPH

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LINE GRAPH

**BE SURE TO LABEL ALL PARTS OF YOUR GRAPH!!!**

Project Proposal Sheet

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Bell \_\_\_\_\_\_\_\_

Title\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Purpose\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hypothesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Materials\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Procedure:

1. Experimental Design:
   1. Independent Variable\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. Dependent Variable\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Constants\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Steps
   1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Results (written and visual)

Conclusion

**Science Fair Project Report Explanation**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Bell\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| Title Page  Name  Bell  Graphic  **Page 1** | Table of Contents  Title of each page and page number(s)  **Page 2** |
| Abstract  Brief summary of experiment which includes purpose, procedure, data, and conclusions. Summary should also include how your experiment contributes to further study of your topic. Also include how the knowledge gained from your experiment could be used to further your study.  **Page 3** | Question  The question you are answering  **Page 4** |
| Hypothesis Statement  If…Then Statement… A Prediction  **Page 5** | Materials  A list of all items used in the experiment  **Page 6** |
| Experimental Design  Independent variable  Dependent Variable  Control (if present)  All Constants  **Page 7** | Steps/Procedure  Numbered step by step instructions of how the experiment was completed.  \*Remember that the steps should be clear enough that another person could repeat the experiment without your help  **Page 8** |
| Observations/Results  A written explanation of what you observed during your experiment  You can insert photos of the experiment in addition to the above  **Page 9** | Graphs, Charts, or Data Table  Visual representation of what you observed in the form of a graph, chart, or data table  **Page 10** |
| Conclusion  Was your hypothesis correct?  What did you learn?  Why do you think you got the results you got?  Connections to real life applications.  What could you do next time to change your experiment?  MUST BE IN PARAGRAPH FORM  **Page 11** | Bibliography  Sources used for background information on project  MLA format  Citationmachine.net  \*Excellent source to properly cite sources\*  **Page 12** |

All pages should be numbered

* Your report should neat and visually pleasant
* Remember that you had 8 weeks to prepare and your work should reflect it
* Photos and drawings are a nice touch
* Don’t forget that you have a oral presentation to present December 21st or 22nd.
  + Creating your pages in PowerPoint allows you to easily display them during your oral presentation
  + What every method you choose for your oral presentation is acceptable- See me if you have a special request, such as video, audio, etc..

**Science Fair Report Rubric (Advanced Science)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Strong Evidence**  **2** | **Some Evidence**  **1** | **No Evidence**  **0** | **Score** |
| **Abstract** summarizes experiment  x2 | Summary of experiment includes purpose, procedures, data, and conclusions. It also includes points for future study. Written in paragraph form. | Summary of experiment included | Abstract not present |  |
| States problem or **question** | Clearly states the problem | Somewhat states the problem | Problem not stated |  |
| Generates **hypothesis**  x2 | Clearly predicts a hypothesis in If….then format that relates to the question | Does not clearly predict a hypothesis but is in the if…then format | Prediction not made |  |
| List **materials** needed | Inclusive list of materials included | Partial list of materials included | Materials not listed |  |
| Identifies **independent variable**  x2 | Clearly identifies independent variable appropriate for experiment | Identifies independent variable | Independent variable not present |  |
| Identifies **dependent variable**  x2 | Clearly identifies dependent variable appropriate for experiment | Identifies dependent variable | Dependent variable not present |  |
| Identifies **constants**  x2 | Clearly identifies an inclusive list of all constants | Partial list of constants | Constants not listed |  |
| Lists **sequential experimental steps**  x2 | Sequentially lists clear and concise steps for experimental design | Lists steps for experimental design | Steps not listed |  |
| **Measurements** present | Metric measurements used and units are appropriate for experiment | measurements used | Measurements are not present |  |
| **Data collection**  Graph, chart, or table  x2 | Graph, chart, or table present and all parts are correctly labeled | Graph, chart, or table present | Graph, chart, or table present not present |  |
| **Interpreting data** summary of observations  x2 | Data summary includes comparisons, patterns, and connections to previously know information | Data summary present | Summary not present |  |
| **Conclusion** based on data  x2 | States if hypothesis was supported or not based on data. Draws conclusion based on data | Draws conclusion based on data | Conclusion not present |  |
| **Bibliography** sources | Bibliography sources relates to experimental design topic | Bibliography present | Bibliography not present |  |
| **Organization** table of contents | Table of contents present. All corresponding pages are numbered and in the correct order | Table of contents present. | Table of contents not present. |  |
| **Report Quality** neat, grammatically correct, and understandable x 2 | Report is creative, neat, without grammatical errors, and easy to follow | Report is neat, with few grammatical errors, and easy to follow | Report is hard to follow, confusing and lacks creative elements |  |
| **Total Score** |  |  |  |  |

HOW TO PREPARE A SCIENCE FAIR PROJECT

THE DISPLAY BOARD

This is a visual way to communicate to others to take your time and do a good job.

All projects are to be displayed on a tri-fold board.

Be sure to follow the directions below and place the appropriate parts in each section.

The display board is mandatory for all advanced students. However, it is optional for core students.

|  |  |  |
| --- | --- | --- |
| Purpose/Question  Hypothesis  Materials | Title  Procedure  IV  DV  Constants  Steps | Results  Conclusion |

**Science Fair Board Rubric**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criteria** | **Strong Evidence**  **2** | **Some Evidence**  **1** | **No Evidence**  **0** | **Score** |
| States problem or **question** | Clearly states the problem | Somewhat states the problem | Problem not stated |  |
| Generates **hypothesis**  x2 | Clearly predicts a hypothesis in If….then format that relates to the question | Does not clearly predict a hypothesis but is in the if…then format | Prediction not made |  |
| List **materials** needed | Inclusive list of materials included | Partial list of materials included | Materials not listed |  |
| Identifies **independent variable**  x2 | Clearly identifies independent variable appropriate for experiment | Identifies independent variable | Independent variable not present |  |
| Identifies **dependent variable**  x2 | Clearly identifies dependent variable appropriate for experiment | Identifies dependent variable | Dependent variable not present |  |
| Identifies **constants**  x2 | Clearly identifies an inclusive list of all constants | Partial list of constants | Constants not listed |  |
| Lists **sequential experimental steps**  x2 | Sequentially lists clear and concise steps for experimental design | Lists steps for experimental design | Steps not listed |  |
| **Measurements** present | Metric measurements used and units are appropriate for experiment | measurements used | Measurements are not present |  |
| **Data collection**  Graph, chart, or table  x2 | Graph, chart, or table present and all parts are correctly labeled | Graph, chart, or table present | Graph, chart, or table present not present |  |
| **Interpreting data** summary of observations  x2 | Data summary includes  comparisons, patterns, and connections to previously know information | Data summary present | Summary not present |  |
| **Conclusion** based on data  x2 | States if hypothesis was supported or not based on data. Draws conclusion based on data | Draws conclusion based on data | Conclusion not present |  |
| **Board Quality** neat, grammatically correct, and understandable  X4 | Board is creative, neat, without grammatical errors, and easy to follow | Board is neat, with few grammatical errors, and easy to follow | Board is hard to follow, confusing and lacks creative elements |  |
| **Total Score** |  |  |  |  |

**44=100**

**43=98**

**42=95**

**41=93**

**40=91**

**39=89**

**38=86**

**37=84**

**36=82**

**35=80**

**34=77**

**33=75**

**32=73**

**31=70**

**30=68**

**29=66**

**28=64**

This form is to be filled out by both the student and parents.

Once the parents have signed below, return this form to your teacher for his/her final approval.

This is my plan for my science fair project. I will do the project myself. My parents or others will help me only by offering guidance, NOT doing the project for me.

My science fair project topic is:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student’s signature

I have reviewed my child’s science project proposal and am familiar with the deadline dates for each part of the project. I approve of the project my child has described and will supervise all parts of the project that could be potentially dangerous.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent’s signature

NOTE:

1. STUDENTS WORKING WITH ANIMALS OR HUMAN SUBJECTS MUST NOT START A PROJECT WITHOUT PRIOR WRITTEN APPROVAL. ALL SURVEYS MUST BE APPROVED IN ADVANCED BY THE APPROPRIATE COMMITTEE.
2. STUDENTS WORKING WITH CHEMICALS, MOLD, BACTERIAL, GLASSWARE, HEAT, ELECTRICITY, OR ANY OTHER POTENTIALLY DANGEROUS ITEMS MUST BE SUPERVISED BY AN ADULT.

I have approved the project as described by the student.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Teacher’s signature